# UNITED STATES PATENT AND TRADEMARK OFFICE

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SHUMAKER & SIEFFERT, P. A.
8425 SEASONS PARKWAY
SUITE 105
ST. PAUL, MN 55125

| EXAMINER |
|---|
| TANG, KAREN C |

| ART UNIT | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/851,363 | JU ET AL. |
| | Examiner | Art Unit | |
| | Karen C Tang | 2662 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL.**    2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-85* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-85* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *5/8/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 1-04)                  Office Action Summary            Part of Paper No./Mail Date 11302004

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

I. Claims 1-14, 16-30, 32-45, 47-61, 63-79, and 81-83 rejected under 35

U.S.C. 102(e) as being anticipated by Wilford et al hereinafter Wilford (US

6,687,247).

1. Referring to Claims 1 and 71, Wilford discloses a routing communication

device (abstract), which consists plurality of interfaces in the communication

system, refer to Fig 1, Col 1, Lines 1-40. Wilford discloses information is pass

from the one of the set input interfaces and forward on to one of a set of output

interfaces (plurality of interfaces). (A routing device comprising: a plurality of

interface modules to communicate data packets using a network; and a router

module to process the data packets and to forward the data packets between the

interface modules.)

2. Referring to Claims 2, 33, and 72, Wilford discloses a fabric Interface

(midplane), which coupled to many interfaces, refer to Fig 1. (further comprising

a midplane coupled to the plurality of interface modules and to the router

module.)

3. Referring to Claims 3, 34, and 73, Wilford discloses in Fig 1, Col 1, Lines 30-

67, a control circuit (control module), and a control element (concentrator).

(wherein the router module comprises a system control module and at least one

concentrator module integrated into a single unit.)

4. Referring to Claims 4, 35, and 74, Wilford discloses in Fig 1, Col 1, Lines 30-

67, a memory controller (memory management circuit) or a Queue manager

(memory management circuit), refer to Col 2, Lines 53-67). (at least one memory

management circuit to provide data to the concentrator module.)

5. Referring to Claims 5, 36, and 75, Wilford discloses in Fig 1, Col 1, Lines 40-

67. a memory coupled to the control element (concentrator module) and

configured to store the data provided to the control element (concentrator

module).

6. Referring to Claims 6, 20, 37, and 51, Wilford discloses in Fig 1, Col 1, Lines

50-67, a memory couples with the controller for the outbound data.  Wilford also

discloses the outbound queue manager (controller) are configured to receive the

packet data, refer to Col 6, Lines 1-25. (wherein the memory is further configured to store data associated with an outbound packet.)

7. Referring to Claims 7 and 38, Wilford discloses in Fig 1, Col 5, Lines 45-55, where there is a buffer (memory), which buffered the modified packets (incoming packet). (wherein the memory is further configured to store incoming data associated with an inbound packet.)

8. Referring to Claims 8, 21, 39, and 52, Wilford discloses in Fig 2, Col 9, Lines 15-25 where memory comprises an SDRAM. (wherein the memory comprises an SDRAM device).

9. Referring to Claims 9, 22, 40, 53, 65, and 77, Wilford discloses in Fig 2, Col 1, Lines 15-30, Col 9, Lines 10-55, the lookup circuits (memory management circuit) examines the packets and find out where is the destination of the packet by enqueue (extract) the header portion of the packet, then sent the data information (notification) to the linecard CPU/control circuits (system control module). (wherein the memory management circuit is further configured to provide a notification to the system control module based on information extracted from an incoming data packet.)

10. Referring to Claims 10, 23, 41, 54, and 66, Wilford discloses packet information consists of source information, destination address information,

source port, and destination port, refer to Col 1, Lines 15-30. Wilford also

discloses the information/packets are being extracted to process the information

first via extraction, refer to Col 7, Lines 50-61. (wherein the extracted information

includes at least one of source address information, destination address

information, source port information, and destination port information.)

11. Referring to Claims 11, 24, 42, 55, 67, and 77, Wilford discloses in Col 7,

Lines 23-25 that a lookup circuit (packet forwarding module) use packet modifier

(extracted information) by referring a forwarding table, refer to Fig 9, Col 8, Lines

1-20, and Col 19, Lines 45-56 and Col 20, Lines 1-25, based on the header

information (extracted information.). (The routing device of claim 9, wherein the

packet forwarding module is configured to select a route by referencing a

forwarding table based on the extracted information.)

12. Referring to Claims12, 26, 43, 57, and 79, Wilford discloses in Col 17, Lines

22-55, the lookup engine (routing engine), he also discloses lookup engine

consists external memory for forwarding table (routing table) to store the routing

table. (a routing engine to store the routing table.)

13. Referring to Claims 13, 27, 44, and 58, Wilford discloses in Col 17, Lines 35-

45, can store (memory) up to 250,000 entries (selected route). (a memory to

store the selected route in a forwarding table.)

14. Referring to Claims 14, 19, 28, 45, 50, 59 and 64, Wilford discloses in Fig 1 and Fig 2, FIFO Controller, Col 7, Lines 15-50, (memory management circuits) to send (forward) the packet (incoming data packet) to the network physical interface (interface module) based on the header information (selected route). (wherein the memory management circuit is configured to forward the incoming data packet to an interface module based on the selected route.)

15. Referring to Claim 16, Wilford discloses a plurality of interfaces cards, refer to Fig 1, Col 1, Lines 30-35, for the communication data packets using network, refer to Col 1, Lines 5-10, a routing devices comprises lookup circuits (lookup circuit), lookup engine (routing engine) refer to Col 17, Lines 22-55, controller (memory management circuit) refer to Col 7, Lines 15-50, and a control circuits (packet processing unit), and a fabric Interface (midplane) coupled to the router device and to the plurality of interfaces cards, refer to Fig 1, Col 1, Lines 30-40 (a plurality of interface cards to communicate data packets using a network', a router module comprising a packet processing circuit, a memory management circuit, and a route lookup circuit integrated into a single module and a routing engine; and a midplane coupled to the router module and to the plurality of interface cards.)

16. Referring to Claims 17 and 48, Wilford discloses in Fig 1, that the Control Element which interconnect the lookup circuits, control circuits, and controllers, refer to Col 1, Lines 30-35, and Col 17, Lines 22-25. (wherein the single module

comprises a single printed circuit card that interconnects the packet processing

circuit, the memory management circuit, and the route lookup circuit.)

17. Referring to Claims 18 and 48, Wilford discloses in Fig 1, a memory (160)

coupled with a memory controller (150) to store incoming data. (a memory

coupled to the packet processing circuit and configured to store incoming data.)

18. Referring to Claims 25, 56, and 68, Wilford discloses refer to Col 20, Lines 9-

20, that LookUp Engine (lookup circuit) designed (configure) forwarding table

(routing table) to provides the index (longest prefix) to select the output

encapsulation (select the route based on the extracted information). (The routing

device of claim 24, wherein the route lookup circuit is configured to selected the

route by performing a longest prefix match based on the extracted information.)

19. Referring to Claims 29, 60, and 69, Wilford discloses a LookUp Engine

Circuit programs L2 remove the L2 Header Removal module (one of the packet

processing circuits) to header from the encapsulation, refer to Col 17, Lines 4-10,

36-45. (wherein the packet processing circuit is configured to remove an L2

header from an incoming data packet.)

20. Referring to Claims 30, 61, and 70, Wilford discloses in Col 27, lines 15-35 of

which that adjacency controller (one of the packet processing circuits) to

compare (program to insert new header to L2) the size of the MTU field (data

packet consists of various fields such as parity bits, valid bits, output info field

and MTU field) and determine the destination (outbound data packet). (wherein

the packet processing circuit is configured to build an L2 header for an outbound

data packet.)

21. Referring to Claims 32 and 82, Wilford discloses a crossbar arrangement in

Fig 1, a plurality of routing interfaces connected to the crossbar arrangement, in

Fig 2, and Col 1, Lines 10-50. He also discloses the routing device, the packet

can forward to an forward to another router/interfaces. (a plurality of routing

devices coupled to the crossbar arrangement, at least one routing device

comprising: a plurality of interface modules to communicate data packets using a

network; and a router module to process the data packets and to forward the

data packets between the interface modules.)

22. Referring to Claims 47 and 83, Wilford discloses a plurality of interfaces

cards, refer to Fig 1, Col 1, Lines 30-35, for the communication data packets

using network, refer to Col 1, Lines 5-10, a routing devices comprises lookup

circuits (lookup circuit), lookup engine (routing engine) refer to Col 17, Lines 22-

55, controller (memory management circuit) refer to Col 7, Lines 15-50, and a

control circuits (packet processing unit), and a fabric Interface (midplane)

coupled to the router device and to the plurality of interfaces cards, refer to Fig 1,

Col 1, Lines 30-40. (A routing arrangement comprising: a crossbar arrangement;

a plurality of routing devices coupled to the crossbar arrangement, at least one

routing device comprising: a plurality of interface cards to communicate data
packets using a network, a router module comprising a packet processing circuit,
a memory management circuit, and a route lookup circuit integrated into a single
module and a routing engine, and a midplane coupled to the router module and
to the plurality of interface cards.)

23. Referring to Claim 61, Wilford discloses in Col 27, lines 15-35 of which that
adjacency controller (one of the packet processing circuits) to compare (program
to insert new header to L2) the size of the MTU field (data packet consists of
various fields such as parity bits, valid bits, output info field and MTU field) and
determine the destination (outbound data packet). Wilford also discloses in Col
27, Lines 55-67 and Col 5, Lines 23-37, Fig 1 of which the L3 header is
recomposed for the output data packet. (wherein the packet processing circuit is
configured to build an L2 header for an outbound data packet.) (wherein the
packet processing circuit is configured to build an L2 header and rewrite an L3
header for an outbound data packet.)

24. Referring to Claim 63. Wilford discloses a routing system consists of a control
element which integrally consists of a lookup circuits (routing lookup circuit), refer
to Col 17, Lines 22-55, controller (memory management circuit) refer to Col 7,
Lines 15-50, and a control circuits (packet processing unit) A router comprising
one hardware board integrally housing a packet processing circuit, a memory
management circuit, and a route lookup circuit.)

25. Referring to Claim 76, Wilford discloses in Fig 1 and 6 a memory, which is associate with the storage for the outbound packet, as well as the inbound packet, refer to Col 9, Lines 15-23, and Col 11, Lines 4-15, He also discloses in Col 9, Lines 34-42, the memory can be configured/modified to store information through the memory controller by the MDRR algorithms. (Configuring the memory to store data associated with at least one of an outbound packet and an inbound packet.)

26. Referring to Claim 81, Wilford discloses a plurality of interfaces cards, refer to Fig 1, Col 1, Lines 30-35, for the communication data packets using network, refer to Col 1, Lines 5-10, a routing devices comprises lookup circuits (lookup circuit), lookup engine (routing engine) refer to Col 17, Lines 22-55, controller (memory management circuit) refer to Col 7, Lines 15-50, and a control circuits (packet processing unit), and a fabric Interface (midplane) coupled to the router device and to the plurality of interfaces cards, refer to Fig 1, Col 1, Lines 30-40. (A method of manufacturing a routing device, the method comprising: providing a plurality of interface cards to communicate data packets using a network; and coupling a router module comprising a packet processing circuit, a memory management circuit, and a route lookup circuit integrated into a single module to the plurality of interface cards via a midplane)

27. Referring to Claim 82, Wilford discloses a crossbar arrangement in Fig 1, a

plurality of routing interfaces connected to the crossbar arrangement, in Fig 2,

and Col 1, Lines 30-50. Refer to Fig 1, Col 1, Lines 1-40, Wilford discloses

information is pass from the one of the set input interfaces and forward on to one

of a set of output interfaces (plurality of interfaces). (A method of manufacturing a

routing arrangement, the method comprising: providing a crossbar arrangement;

and coupling a plurality of routing devices to the crossbar arrangement, at least

one routing device comprising: a plurality of interface modules to communicate

data packets using a network; a route module to process the data packets and to

forward the data packets between the interface modules.)

28. Referring to Claim 83, Wilford discloses a crossbar arrangement in Fig 1, a

plurality of routing interfaces connected to the crossbar arrangement, in Fig 2,

and Col 1, Lines 30-50. Wilford discloses a plurality of interfaces cards, refer to

Fig 1, Col 1, Lines 30-35, for the communication data packets using network,

refer to Col 1, Lines 5-10, a routing devices comprises lookup circuits (lookup

circuit), lookup engine (routing engine) refer to Col 17, Lines 22-55, controller

(memory management circuit) refer to Col 7, Lines 15-50, and a control circuits

(packet processing unit), and a fabric Interface (midplane) coupled to the router

device and to the plurality of interfaces cards, refer to Fig 1, Col 1, Lines 30-40.

(A method of manufacturing a routing arrangement, the method comprising:

providing a crossbar arrangement; and coupling a plurality of routing devices to

the crossbar arrangement, at least one routing device comprising: a plurality of

interface cards to communicate data packets using a network, a router module

comprising a packet processing circuit, a memory management circuit, and a

route lookup circuit integrated into a single module, and a midplane coupled to

the router module and to the plurality of interface cards.)


### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

II. Claims 15, 31, 46, 62 and 80, 84, 85 are rejected under 35 U.S.C.

103(a) as being unpatentable over Wilford et al hereinafter Wilford  (US

6,687,247) in view of Zadikian et al hereinafter Zadikian (US 6,724,757).


1. Referring to Claims 15, 31, 46, 62 and 80, Wilford discloses a router module to

process the data packet and to forward the data packet between the interface

modules, refer to Fig 1, Col 1, Lines 1-40.

Wilfrod does not expressly disclose a redundant router in response to the

malfunction of the router module.

Zadikian discloses a redundant router, refer to Col 8, Lines 10-25.

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to combine both Wilford and Zadikian's inventions.

The suggestion/motivation for implemented a redundant part is that Wilford

discloses that each routing device/system consists a set of linecards, and each

linecard consists of identical parts. Thus it would have been obvious to

implement another identical router in the event of system failure.

The benefit would have been that when failure of the router occur, there is

always a backup and also can improve the switching speed and minimizes the

impact of such redundancy on other connections.


2. Referring to Claim 84, Wilford discloses a crossbar arrangement in Fig 1, a

plurality of routing interfaces connected to the crossbar arrangement, in Fig 2,

and Col 1, Lines 30-50. Wilford discloses a routing communication device

(abstract), which consists plurality of interfaces in the communication system,

refer to Fig 1, Col 1, Lines 1-40. Wilford discloses a plurality of interfaces cards,

refer to Fig 1, Col 1, Lines 30-35, for the communication data packets using

network, refer to Col 1, Lines 5-10, Refer to Fig 1, Col 1, Lines 1-40, Wilford

discloses information is pass from the one of the set input interfaces and forward

on to one of a set of output interfaces (plurality of interfaces).

Wilford discloses that the switch fabric (switch arrangement), in the outbound

linecard, refer to Col 6, Lines 6-23. he also discloses linecards (plurality of

routing device) are interface with communication devices.

He does not expressly disclose a switch device configured to switch control from

a first routing device to a second routing device.

Zadikian discloses in Col 10, Lines 10-50, he discloses a switch element and

how a linecards (plurality of routing devices) are connected to two separate

copies of the main matrix, and once the error is detected, the switch device

would sent the signal to the backup linecard (routing device).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to combine both Wilford and Zadikian's inventions.

The suggestion/motivation for implemented a redundant part is that Wilford

discloses that each routing device/system consists a set of linecards (routing

devices), and each linecard consists of identical parts (identical linecards and

which one can be a backup copies). He also indicate there is a switch fabric

device (switch element), refer to Fig 1 and 2. It would only been obvious for one

ordinary skill in the art to implement a switch device which switch from the

original router device to the backup router device once the error is detected.

The benefit would have been that when failure of the router occur, there is

always a backup and can avoid the traffic congestion.

(A routing arrangement comprising: a plurality of routing devices coupled to the

crossbar arrangement, at least one routing device comprising: a plurality of

interface modules to communicate data packets using a network; and a router

module to process the data packets and to forward the data packets between the

interface modules; and a switch arrangement coupled to the plurality of routing

devices and configured to switch control from a first routing device to a second

routing device.)


3. Referring to Claim 85, Wilford discloses a plurality of interfaces cards, refer to

Fig 1, Col 1, Lines 30-35, for the communication data packets using network,

refer to Col 1, Lines 5-10, a routing devices comprises lookup circuits (lookup

circuit), lookup engine (routing engine) refer to Col 17, Lines 22-55, controller

(memory management circuit) refer to Col 7, Lines 15-50, and a control circuits

(packet processing unit), and a fabric Interface (midplane) coupled to the router

device and to the plurality of interfaces cards, refer to Fig 1, Col 1, Lines 30-40.

Wilford discloses a crossbar arrangement in Fig 1, a plurality of routing interfaces

connected to the crossbar arrangement, in Fig 2, and Col 1, Lines 30-50. Wilford

discloses that the switch fabric (switch arrangement), in the outbound linecard,

refer to Col 6, Lines 6-23. he also discloses linecards (plurality of routing device)

are interface with communication devices.

He does not expressly disclose a switch device configured to switch control from

a first routing device to a second routing device.

 Zadikian discloses in Col 10, Lines 10-50, he discloses a switch element and

how a linecards (plurality of routing devices) are connected to two separate

copies of the main matrix, and once the error is detected, the switch device

would sent the signal to the backup linecard (routing device).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to combine both Wilford and Zadikian's inventions.

The suggestion/motivation for implemented a redundant part is that Wilford

discloses that each routing device/system consists a set of linecards (routing

devices), and each linecard consists of identical parts (identical linecards and

which one can be a backup copies). He also indicate there is a switch fabric

device (switch element), refer to Fig 1 and 2. It would only been obvious for one

ordinary skill in the art to implement a switch device which switch from the

original router device to the backup router device once the error is detected.

The benefit would have been that when failure of the router occur, there is

always a backup and can avoid the traffic congestion.

(A outing arrangement comprising: a plurality of routing devices coupled to the

crossbar arrangement, at least one routing device comprising: a plurality of

interface cards to communicate data packets using a network, a router module

comprising a packet processing circuit, a memory management circuit, and a

route lookup circuit integrated into a single module and a routing engine, and a

midplane coupled to the router module and to the plurality of interface cards; and

a switch arrangement coupled to the plurality of routing devices and configured to

switch control from a first routing device to a second routing device.)

## *Conclusion*

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

-   US 6,754,210 (Ofek discloses shared medium access scheduling with

    common time reference).

-   US 6,359,879 (Carvey et al discloses a composite trucking)

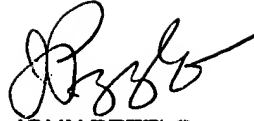-   US 6,760,328 (Ofek discloses a scheduling with different time intervals.)

## *Contact*

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Karen C Tang whose telephone number is

(571)272-3116. The examiner can normally be reached on M-F 7 - 3.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Hassan Kizou can be reached on (571)272-3088. The

fax phone number for the organization where this application or proceeding is

assigned is 703-872-9306.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free).

KT

JOHN PEZZLO
PRIMARY EXAMINER